

REMARKS/DISCUSSION:

This Amendment A is being filed within three months of the shortened statutory period for response that ends on April 25, 2005. Accordingly, a Petition for an extension of time is not required.

By this Amendment A, claims 1-32 remain pending in this application. Claims 1, 13, 16, 25 and 30 have been amended to specify that the signals are time varying signals. Support that the signals are time varying is found, for example, from figures 4, 5 and 7, wherein figure 4 plots the amplitude A of the first signal F_1 as a function of time t, wherein figure 5 plots the amplitude A of the second signal F_2 as a function of time t, and wherein figure 7 plots the difference signal (which is the F_1 signal minus the F_2 signal) as a function of time t. Also see page 5, lines 22, 23 and 25 and page 7, line 27 to page 8, line 8.

Amendment and/or cancellation of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims previously presented. Further, Applicant(s) reserves the right to prosecute the subject matter of such claims in continuation and/or divisional applications.

Applicant has carefully studied the outstanding Office Action. This Amendment is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reexamination, reconsideration and allowance of the application are respectfully requested.

Rejection under 35 U.S.C. § 102(b)

Claims 1-4, 9, 10, 16-19, 23, 24 and 30 stand rejected as being anticipated by Akazaki (US 5,005,580). Claims 2-4 and 9-10 depend from claim 1, and claims 17-19 and 23-24 depend from claim 16. Applicants respectfully traverse the rejection.

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Amended Claim 1 requires receiving time-varying first and second signals F_1 and F_2 (see figures 4-5) from the same location and subtracting the second signal from the first signal to derive a time-varying difference signal (see figure 7). Note that in the example shown in Applicants' figure 1, the transducer is repositioned (block 30) if the treatment is not complete with another time-varying first and second signal received and another time-varying difference signal derived at the different location of the repositioned transducer.

Okazaki discloses in figure 4A a pixel gradation graph 22 of an image from a kidney before treatment, discloses in figure 4B a pixel gradation graph 22' of an image from the kidney during treatment, and discloses in figure 4C a pixel gradation graph 23 obtained from the subtraction of the pixel gradation graphs 22 and 22'. Note that each graph is a graph of pixel gradation versus position (i.e., location), and that pixel gradation reflects the amplitude of the received signal. Note that figure 2 of Okazaki discloses an imaging scan area 27, which includes locations in line with, and to the sides of, the kidney 18. The amplitude of the signal at a first location (for example, a location one inch to the right of the pixel gradation axis) of a plurality of locations in figure 4B of Okazaki is subtracted from the amplitude of the signal at the same first location of the plurality of locations in figure 4A to yield the difference in the amplitudes at the same first location of the plurality of locations in figure 4C. As noted in the specification, page 8, lines 5-7, computing the amplitude of the signal differences is different from computing the differences in signal amplitude.

Amended Claim 1 requires subtracting time-varying signals received from the same location to obtain a time-varying difference signal whereas Okazaki discloses subtracting time-invariant amplitudes of signals received from the same location to obtain a time-invariant difference in amplitudes.

Amended Claims 16 and 30 likewise require deriving a time-varying difference signal or a set of time-varying difference signals, whereas Okazaki only discloses time-invariant differences in amplitude.

Claims 2-4 and 9-10 depend from claim 1, and claims 17-19 and 23-24 depend from

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claim 16. Without acquiescing in any way to arguments presented by the Examiner as to these dependent claims, Applicants submit that these claims are likewise patentable over Okazaki for at least the same reasons as discussed above with respect to claims 1 and 16, by virtue of their dependency from claims 1 and 16, respectively. Withdrawal of the rejections as to these claims is likewise requested.

Rejection under 35 U.S.C. § 102(e)

Claims 4, 9-10, 16-19, 23-24 and 30 stand rejected as being anticipated by Lizzi et al. (US 6,533,726). Claims 2-4 and 9-10 depend from claim 1, and claims 17-19 and 23-24 depend from claim 16. Applicants respectfully traverse the rejection.

Amended Claim 1 requires receiving time-varying first and second signals F_1 and F_2 (see figures 4-5) from the same location and subtracting the second signal from the first signal to derive a time-varying difference signal (see figure 7). Note that in the example shown in applicant's figure 1, the transducer is repositioned (block 30) if the treatment is not complete with another time-varying first and second signal received and another time-varying difference signal derived at the different location of the repositioned transducer.

Lizzi discloses in figure 3 acquiring first, second and third image scans and subtracting the second image scan from the third image scan (block 340) and subtracting the first image scan from the third image scan (block 345) to decide when to end therapy (block 350). A first image scan is a time-invariant image scan associated with a first time. A second image scan is a time-invariant image scan associated with a second time. A third image scan is a time-invariant image scan associated with a third time. Subtraction involving such image scans results in a time-invariant image scan. This is in contrast to applicant's claim 1 which requires time-varying first and second signals and a time-varying difference signal.

Amended Claims 16 and 30 likewise require deriving a time-varying difference signal or a set of time-varying difference signals, whereas Lizzi only discloses differences in time-invariant image scans.

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Claims 2-4 and 9-10 depend from claim 1, and claims 17-19 and 23-24 depend from claim 16. Without acquiescing in any way to arguments presented by the Examiner as to these dependent claims, Applicants submit that these claims are likewise patentable over Lizzi for at least the same reasons as discussed above with respect to claims 1 and 16, by virtue of their dependency from claims 1 and 16, respectively. Withdrawal of the rejections as to these claims is likewise requested.

Rejection under 35 U.S.C. § 103(a)

Claim 5 stands rejected as being unpatentable over Okazaki or Lizzi and further in view of Cain (US 5,590,657) and is respectfully traversed. Claim 5 depends from Claim 1, and Applicants' previous remarks concerning the patentability of Claim 1 over Okazaki and Lizzi are herein incorporated by reference. Further, Cain adjusts phase to refocus and not to reduce motion artifacts as required by Applicants' Claim 5.

Claims 6, 7, 11, 12, 20 and 21 stand rejected as being unpatentable over Okazaki or Lizzi and further in view of Dory (US 5,354,258) and is respectfully traversed. Claims 6-7 and 11-12 depend from Claim 1, Claims 20-21 depend from claim 16, and Applicants' previous remarks concerning the patentability of Claims 1 and 16 over Okazaki and Lizzi are herein incorporated by reference. Further, the potentiometer 74 of Dory provides a variable mix of the latest image stored and the differential image and does not scale a difference signal as required by Applicants' claim 6.

Claims 8 and 22 stand rejected as being unpatentable over Okazaki or Lizzi and further in view of Geiser (US 6,106,470) and is respectfully traversed. Claim 8 depends from Claim 1, Claim 22 depends from Claim 16, and applicant's previous remarks concerning the patentability of claims 1 and 16 over Okazaki and Lizzi are herein incorporated by reference.

Claims 13-15 and 25-29 stand rejected as being unpatentable over Okazaki or Lizzi and further in view of both Dory and Geiser and is respectfully traversed. Claims 14-15 depend from Claim 13, and Claims 26-29 depend from claim 25.

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Claim 13 requires receiving time-varying first and second signals F_1 and F_2 (see figures 4-5) from the same location and subtracting the second signal from the first signal to derive a time-varying difference signal (see figure 7). As previously discussed, Okazaki only discloses time-invariant differences in amplitude, and Lizzi only discloses differences in time-invariant image scans.

Claim 25 requires receiving first and second sets of frames comprising a plurality of time-varying imaging ultrasound wave signals from the same location during two different time periods and subtracting the time-varying imaging ultrasound signals of the second set of frames from the time-varying ultrasound signals of the first set of frames to derive a time-varying difference signal. As previously discussed, Okazaki only discloses time-invariant differences in amplitude, and Lizzi only discloses differences in time-invariant image scans.

Further, the potentiometer 74 of Dory provides a variable mix of the latest image stored and the differential image and does not scale a difference signal as required by applicant's claims 13 and 25.

Claims 31 and 32 stand rejected as being unpatentable over Okazaki or Lizzi and further in view of Fujimoto (US 6,540,700) and is respectfully traversed. Claims 31-32 depend from Claim 30, and applicant's previous remarks concerning the patentability of Claim 30 over Okazaki and Lizzi are herein incorporated by reference.

Conclusion

Applicants submit that in view of the discussion, the rejections under 35 U.S.C. §§ 102 and 103 have been overcome and that the invention is now patentable over the cited prior. The Examiner is respectfully requested to reconsider all rejections and pass this case to issue.

Should any minor points remain prior to issuance of a Notice of Allowance, the Examiner is requested to telephone the undersigned at the below-listed telephone number.

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The Commissioner is hereby authorized to charge any additional fees, which may be required to Account No. 10-0750/END-5042/VEK.

Respectfully submitted,

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